

1/8/18 "Mistakes are the portal of Discovery." - James Joyce

HW: "Function Notation" HW
Test 3 on Tuesday 1/16

AIM: How do we evaluate functions?

Warm Up:

1) Express in simplest form, along with restrictions: $\frac{\frac{x}{x+2}}{1 - \frac{x}{x+2}}$

FUNCTION NOTATION

$$y = f(x)$$

Output $\xrightarrow{\quad}$ Rule $\xleftarrow{\quad}$ Input

Exercise #1: Evaluate each of the following given the function definitions and input values.

(a) $f(x) = 5x - 2$

(b) $g(x) = x^2 + 4$

$$f(3) = 5(3) - 2 = 13$$

$$g(3) = (3)^2 + 4 = 13$$

$$f(-2) = 5(-2) - 2 = -12$$

$$g(0) = (0)^2 + 4 = 4$$

$$f(a+1) = 5(a+1) - 2$$

$$5a + 5 - 2$$

$$5a + 3$$

$$g(x-2) = (x-2)^2 + 4$$

$$x^2 - 4x + 4 + 4$$

$$x^2 - 4x + 8$$

Exercise #2: Boiling water at 212 degrees Fahrenheit is left in a room that is at 65 degrees Fahrenheit and begins to cool. Temperature readings are taken each hour and are given in the table below. In this scenario, the temperature, T , is a function of the number of hours, h .

h (hours)	0	1	2	3	4	5	6	7	8
$T(h)$ (°F)	212	141	104	85	76	70	68	66	65

(a) Evaluate $T(2)$ and $T(6)$.

104 68


(b) For what value of h is $T(h) = 76$?

$h = 4$

(c) Between what two consecutive hours will $T(h) = 100$?

between 2 and 3

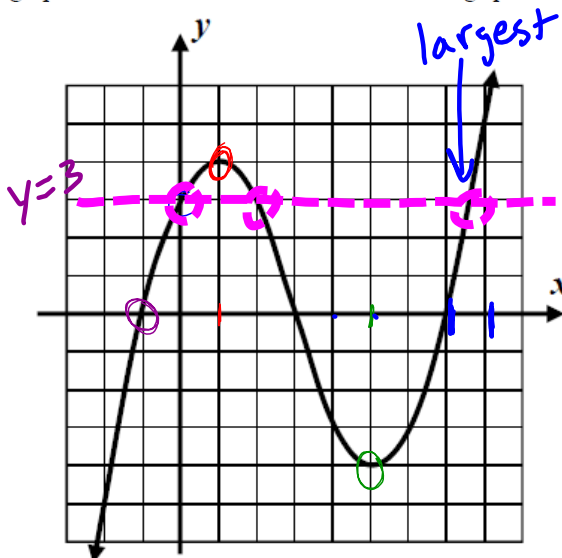
$$2 < h < 3$$

$$(x-2)^2 = (x-2)(x-2)$$

$$x^2 - 2x - 2x + 4$$
$$x^2 - 4x + 4$$

Exercise #3: The function $y = f(x)$ is defined by the graph shown below. Answer the following questions based on this graph.

- (a) Evaluate $f(-1)$, $f(1)$, and $f(5)$.

0 4 -4



- (b) Evaluate $f(0)$. What special feature on a graph does $f(0)$ always correspond to?

$f(0) = 3$ that is the y-intercept

- (c) What values of x solve the equation $f(x) = 0$?

What special features on a graph does the set of x -values that solve $f(x) = 0$ correspond to?

$y = 0$ @ $x = -1, 3, 7$ roots, x-intercepts, zeros, or solutions

- (d) Between what two consecutive integers does the largest solution to $f(x) = 3$ lie?

where $y = 3$
does

the largest is
between
 $x = 7$ and $x = 8$

Exercise #4: For a function $y = g(x)$ it is known that $g(-2) = 7$. Which of the following points must lie on the graph of $g(x)$?

(1) $(7, -2)$

(3) $(0, 7)$

(2) $(-2, 7)$

(4) $(-2, 0)$



Exercise #5: Physics students drop a ball from the top of a 50 foot high building and model its height as a function of time with the equation $h(t) = 50 - 16t^2$. Using TABLES on your calculator, determine, to the nearest tenth of a second, when the ball hits the ground. Provide tabular outputs to support your answer.

input
so use
x instead
of t

$$y = 50 - 16x^2$$

⊗ When ball hits ground

$$h(t) = 0, \text{ where is } y = 0?$$

$$t \approx 1.8 \text{ seconds}$$